

WHAT IS CLAIMED IS:

1. An exhaust gas purification system of an internal combustion engine, the exhaust gas purification system comprising:

an exhaust gas after-treatment device, which is disposed in an exhaust passage of the engine and supports a catalyst;

temperature sensing means for estimating temperature of the exhaust gas after-treatment device;

hydrocarbon supplying means for supplying hydrocarbon to the exhaust gas after-treatment device; and

hydrocarbon supply quantity controlling means for determining an upper limit value of the permissible quantity of the hydrocarbon supplied to the exhaust gas after-treatment device in accordance with the temperature of the exhaust gas after-treatment device estimated by the temperature sensing means, and for controlling the hydrocarbon supplying means so that the quantity of the hydrocarbon supplied to the exhaust gas after-treatment device becomes equal to or less than the upper limit value.

2. The exhaust gas purification system as in claim 1, wherein

the hydrocarbon supplying means supplies the hydrocarbon to the exhaust gas after-treatment device by performing a post injection of fuel after a main injection of the fuel, by retarding injection timing of the fuel, or by increasing a quantity of the exhaust gas recirculated into intake air.

3. The exhaust gas purification system as in claim 1,
further comprising:

hydrocarbon quantity sensing means for sensing the
quantity of the hydrocarbon supplied to the exhaust gas after-
treatment device, wherein

the hydrocarbon supply quantity controlling means
controls the hydrocarbon supplying means so that the quantity
of the hydrocarbon sensed by the hydrocarbon quantity sensing
means becomes equal to or less than the upper limit value.

4. The exhaust gas purification system as in claim 3,
wherein

the hydrocarbon quantity sensing means calculates the
quantity of the hydrocarbon supplied to the exhaust gas after-
treatment device by adding a quantity of unburned hydrocarbon
generated through combustion in the engine to the quantity of
the hydrocarbon supplied by the hydrocarbon supplying means.

5. The exhaust gas purification system as in claim 1,
wherein

the temperature sensing means senses temperature of the
exhaust gas upstream of the exhaust gas after-treatment device
as the temperature of the exhaust gas after-treatment device.

6. The exhaust gas purification system as in claim 1,
wherein

the exhaust gas after-treatment device includes at least

one selected from the group of a diesel particulate filter having an oxidation catalyst, a nitrogen oxide removal catalyst, an oxidation catalyst and a three-way catalyst.